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## TAXIMETRICS STUDY OF VARIETIES
## OF BIDENS PILOSA SPECIES

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## Abstract

Hooker (1882) has reported three varieties in *Bidens pilosa* species i. e., *pilosa* Proper, Linn. *bipinnata* Linn. and *decomposita* Wall. Clarke (1876) has included var. *decomposita* into *B. pilosa* proper. Taxonomic position of varieties *pilosa* proper and *bipinnata* is much confusing in literature. Babu (1977) has raised varieties *pilosa* proper and *bipinnata* as distinct species level into *B. pilosa* and *B. bipinnata* respectively. The present taximetric study also justified the distinction of these varieties as specific level.

Hooker has reported three varieties of species *B. pilosa* i.e., *pilosa* proper Linn., *bipinnata* Linn., and *decomposita* Wall. from the Himalayan region of India. Clarke (1876) has included var. *decomposita* into *B. pilosa* proper. During taxonomic work *on* the family Compositae author has found that taxonomic position of var. *pilosa* proper and *bipinnata* is much confusing in literature. Babu (1977) has raised varieties *pilosa* proper and *bipinnata* as distinct species level. Looking to this discretion, it was decided to use taximetrics in interpreting taxonomic status of these taxa.

## Materials and Method

The plants of these taxa (referred to as Operational Taxonomic Units here after) i.e., *B. bipinnata* (OTU 1) and *B. pilosa* (OTU 2) were studied numerically for seventeen quantitative characters. Nearly one thousand individuals of each taxa were collected from different localities to consider maximum variations and they were measured in millimeters for all the characters. The mean, standard error of each character were calculated. Based on these, Keul's Multiple Range Test (Woolf, 1968) was performed for taxonomic comparison of OTU's. This method was found to be of great use in comparing a series of means simultaneously showing thereby similarities and differences of individual OTU's with reference to any particular character. Results of KMRT are given in Table 1. In this table, means which are not over a continuous line differed significantly, while those over the same line do not differed significantly.

## Results & Discussion

Taximetric analysis revealed dissimilarities between OTU 1 (*B. bipinnata*) and OTU 2 (*B. pilosa* proper). Except the similarities in leaf breadth and achene diameter of disk floret, both differed significantly in vegetative as well as floral characters. OTU 1 differed from OTU 2 in smaller size of the corolla tube and achene of disk floret

Table 1 **Results of KMRT analysis of quantitaive characters**

| Characters | OTU No. | With mean & SE |
|---|---|---|
| 1. Petiole length | 2<br>14.0±1.73 | 1<br>18.0±1.09 |
| 2. Leaf length | 2<br>55.0±3.03 | 1<br>61.0±2.97 |
| 3. Leaf breadth | 1<br>40.0±2.45 | 2<br>40.0±4.59 |
| 4. Peduncle length | 2<br>27.0±3.74 | 1<br>61.0±12.17 |
| 5. Capitulum length | 2<br>10.0±0.34 | 1<br>18.0±0.91 |
| 6. Capitulum diameter | 2<br>6.0±0.16 | 1<br>9.5±0.35 |
| 7. Involucre bracts length | 2<br>4.0±0.17 | 1<br>8.0±0.52 |
| DISK FLORET | | |
| 8. Floret length | 2<br>5.0±0.0 | 1<br>12.5±0.35 |
| 9. Pappus length | 2<br>2.0±0.06 | 1<br>10.5±0.35 |
| 10. Corolla tube length | 1<br>3.0±0.13 | 2<br>4.0±0.0 |
| 11. Achene length | 2<br>7.0±0.37 | 1<br>16.0±0.52 |
| 12. Achene diameter | 1<br>1.0±0.00 | 2<br>1.0±0.0 |
| Ray floret | | |
| 13. Floret length | 2<br>9.0±0.35 | 1<br>11.0±0.34 |
| 14. Corolla tube length | 2<br>7.5±0.0 | 1<br>15.5±0.19 |
| 15. Pappus length | 2<br>2.0±0.0 | 1<br>3.0±0.0 |
| *16. Achene length | 2<br>0.0±0.0 | 1<br>5.5±1.17 |
| *17. Achene diameter | 2<br>0.0±0.0 | 1<br>1.0±0.0 |

\* Reading of these characters could not be taken as ray florets were not fertile.

on one hand and larger petiole, leaf, peduncle, capitulum, involucre bracts, florets of both type, pappus, and achene of disk floret on the other (Table 1). Distinction between OTU's 1 and 2 could also be made in other morphological characters, of which the most important one's is the ray floret which was found fertile in the former and sterile in latter.

Babu (1977) has observed striking differences between these two taxa and he has raised the varieties *pilosa* proper and *bipinnata* of *B. pilosa* species of Hooker as distinct species level. The former has lower imparipinnate, upper simple leaves, 4—5 white marginal florets and corolla 3-dentate, while latter has 2—3 pinnatipartite leaves. 2—4 yellow marginal florets and 2-dentate corolla. Sahu (1978—1979) has also found dissimilarities between these taxa in trichome pattern. *B. bipinnata* could easily be separated from *B. pilosa* by presence of biseriate flagellate hairs. The present studies

also suggest that the investigated taxa are quite distinct. Looking to these differences author feels that the varieties *pilosa* proper and *bipinnata* of species *B. pilosa* of Hooker (1882), should be raised as a specific level i.e., *B. pilosa* and *B. bipinnata* respectively as done by Babu (1977).

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